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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/920,984	08/02/2001	Kentaro Miyano	MAT-8170US	6130

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RATNER AND PRESTIA
Suite 301
One Westlakes, Berwyn
P.O. Box 980
Valley Forge, PA 19482-0980

EXAMINER	
NGUYEN, QUYNH H	

ART UNIT	PAPER NUMBER
2642	

DATE MAILED: 07/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/920,984	MIYANO ET AL.	
	Examiner	Art Unit	
	Quynh H. Nguyen	2642	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 April 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *26 and 28-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *34-37,43-45 and 48-50* is/are allowed.

6)☒ Claim(s) *26,28-33,38-41,46 and 47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

DETAILED ACTION

1. Applicant's amendment filed 4/15/05 has been entered. Claims 26, 28, 32, 37-40, 45, and 49 have been amended. Claim 27 has been cancelled. No claims have been added. Claims 26 and 28-50 are still pending, with claims 26, 32, 34, 35, 40, 42, 43, and 48 being independent.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 102

3. Claims 26, 32, and 40 are rejected under 35 U.S.C. 102(e) as being anticipated by Ylitalo et al. (U.S. Patent 6,788,661).

As to claim 26, Ylitalo et al. teach a method of providing an antenna pattern corresponding to a plurality of antenna elements (col. 11, lines 1-4) comprising the steps of: selecting an arbitrary beam width and a beam direction for the pattern (col. 14, line 64 through col. 15, line 7); and providing the antenna pattern corresponding to the plurality of antenna elements of the array antenna according said selected beam width and beam direction (col. 15, lines 5-7).

Claims 32 and 40 are rejected for the same reasons as discussed above with respect to claim 1. Furthermore, Ylitalo et al. teach a calculator (Beam forming antenna

40) for establishing an antenna pattern; and a pathway for effecting signals obtained by use of the antenna based on the established antenna pattern (col. 8, lines 46-65).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 28-31, 33, 38-39, 41, and 46-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ylitalo et al. (U.S. Patent 6,788,661) in view of Fukagawa et al (U.S. Patent 6,529,745).

As to claim 28, Ylitalo et al. do not explicitly teach the beam width and beam direction are determined from incoming radio waves estimated in relation to traffic conditions.

Fukagawa et al. teach the beam width and beam direction are determined from incoming radio waves estimated in relation to traffic conditions (col.3, lines 50-53).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the feature of the beam width and beam direction are determined from incoming radio waves estimated in relation to traffic conditions, as taught by Fukagawa, into Ylitalo's system thus making the system better for providing the antenna pattern by forming the beams from different incoming radio waves from a plurality of mobile stations

As to claim 29, Fukagawa et al. teach at least one of the beam direction and the beam width are selected from preset values (col. 3, line 65 through col. 4, line 4).

As to claims 30 and 31, Fukagawa et al. teach the steps of estimating coefficients of a linear array based on the selected beam width and beam direction; calculating the coefficients by a Fourier series; transforming the coefficients into coefficients of a circular array; wherein the antenna pattern is provided based upon the coefficients of the circular array (col. 4, lines 10-31).

As to claim 33, Fukagawa et al. teach a frequency converter for converting the radio frequency signals received by the array antenna to intermediate frequency signals (col. 4, lines 47-52), wherein the intermediate frequency signals are multiplied by coefficients calculated by the calculator to form resultant signals (col. 4, lines 10-18).

As to claims 38 and 46, Fukagawa et al. teach an arrival direction estimating unit for estimating arrival directions of incoming radio waves in relation to traffic conditions (col. 3, line 65 through col. 4, line 3); and statistically processing outputs of the arrival direction estimating unit to determine the beam direction and the beam width (col. 4, lines 3-9 and line 65 through col. 5, line 8).

As to claims 39 and 47, Fukagawa et al. teach that in beam forming section 17, multipliers 32A, 32B, and 32C, and adder 33 for calculating a radiation pattern of an antenna (Fig. 3 and col. 6, lines 15-35), therefore, it would have been obvious that there exist a storage unit for storing values that are used for the calculation. For example, beam directions.

Claim 41 is rejected for the same reasons as discussed above with respect to claim 33. Furthermore, Fukagawa et al. teach splitting a transmit signal into signals (col. 4, lines 56-64 – digital and analog signals).

Allowable Subject Matter

6. Claims 34-37, 42-45, and 48-50 are allowed.

7. The following is an examiner's statement of reasons for allowance:

As to claims 34 and 35, the prior art fails to teach a receiver comprising: a circular array antenna; a frequency converter; plurality of receive beam formers coupled in parallel to the receive frequency converter, each of the receive beam formers for respectively multiplying either the intermediate frequency signals or the baseband signals by the coefficients calculated by the coefficient calculator and combining resultant signals; a coefficient calculator coupled to the receive beam formers for setting the number of beams which is equal to the number of receive beam formers.

Claims 36 and 37 are allowed because they depend on allowable claim 34.

As to claim 42, the prior art fails to teach a transmitter comprising: a circular array antenna; a plurality of transmit frequency converters; plurality of transmit beam formers, each of the transmit beam formers for splitting a transmit signal into signals, the number of which is the same as the number of antenna elements of the circular array antenna, and respectively multiplying the signals by the coefficients calculated by the coefficient

thereby to form transmit beams; and a coefficient calculator coupled to the transmit beam formers for setting the number of beams which is equal to the number of transmit beam formers.

Claim 44 is allowed because it depends on allowable claim 42.

As to claim 43, the prior art fails to teach a transmitter comprising: a circular array antenna; a plurality of transmit frequency converters; plurality of transmit beam formers and transmit frequency converter are coupled in parallel to the circular array antenna, each of the transmit beam formers for splitting a transmit signal into signals, the number of which is the same as the number of antenna elements of the circular array antenna, and respectively multiplying the signals by the coefficients calculated by the coefficient thereby to form transmit beams; and a coefficient calculator coupled to the transmit beam formers for setting the number of beams which is equal to the number of transmit beam formers.

As to claim 48, the prior art fails to teach a radio unit for use with a circular antenna having a plurality of antenna elements disposed circularly, the radio unit comprising: a circular array antenna; a calculator coupled to the receive beam former and the transmit beam former for establishing an antenna pattern; a receiver and transmit frequency converters; a receive beam former for respectively multiplying either the intermediate frequency signals or the baseband signals by the coefficients calculated by the coefficient calculator and combining resultant signals; and a transmit beam former for splitting a transmit signal into signals, the number of which is the same

as the number of antenna elements of the circular array antenna, and respectively multiplying the signals by the coefficients thereby to form transmit beams.

Claims 45 and 49-50 are allowed because it depends on allowable claim 48.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

8. Applicant's arguments with respect to claims 26, 28-33, 38-41, and 46-47 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quynh H. Nguyen whose telephone number is 703-305-5451. The examiner can normally be reached on Monday - Thursday from 6:30 A.M. to 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ahmad Matar, can be reached on (703) 305-4731. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

qhn

Quynh H. Nguyen
July 11, 2005

WILLIAM J. DEANE, JR.
PRIMARY EXAMINER